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(54) PRODUCTION OF COMPOSITION FOR FORMING FILM, COMPOSITION FOR FORMING FILM AND MATERIAL FOR FORMING INSULATING FILM

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain the subject composition useful as an interlayer dielectric in a semiconductor element, etc., having a low dielectric constant and mechanical strength of coating film and long-term preservability of solution by hydrolyzing a specific compound and a specified metal chelate compound in the presence of an acid catalyst in a fixed solvent.

SOLUTION: (A) One or more compounds selected from the group consisting of (i) a compound of formula I (R1 is H, F or a monofunctional organic group; R2 is a monofunctional organic group; a is 0-2) such as trimethoxysilane, etc., and (ii) a compound of formula II [R3 to R6 are each a monofunctional organic group; b and c are each 0-2; R7 is O, (CH2)_n (n is 1-6); d is 0 or 1] such as hexamethoxydisiloxane, etc., and (B) a chelate compound of formula III (R8 is a chelating agent; M is metal atom; R9 is a 2-5C alkyl or a 6-20C aryl; f is a valence of M; e is an integer of 1-f) such as triethoxy.mono(acetylacetonato) titanium, etc., are hydrolyzed in the presence of an acid catalyst in a solvent of formula IV (R10 and R11 are each H or a 1-4C alkyl; R12 is an alkylene; g is 1 or 2) to give the objective composition for forming a film.

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(54) FORMING METHOD OF SILICA BASE FILM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a silica based film useful as an interlaminar insulating film in a semiconductor element or the like and having low density, low dielectric constant, high elastic modulus and low water absorption.

SOLUTION: The silica based film is obtained by applying a coating composition containing polysiloxane A, an organic polymer B and an organic solvent C on a substrate and after removing the organic solvent, heating the substrate at 250-400°C in an vacuum or inert gas atmosphere, next heating it at 250-400°C in an atmosphere of oxygen partial pressure not less than 1 Pa and further heating it at a temperature of 350-470°C in an atmosphere of oxygen partial pressure less than 1 Pa.

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